



# **Water Company Acquisition**

## ***Engineering***

August 2018

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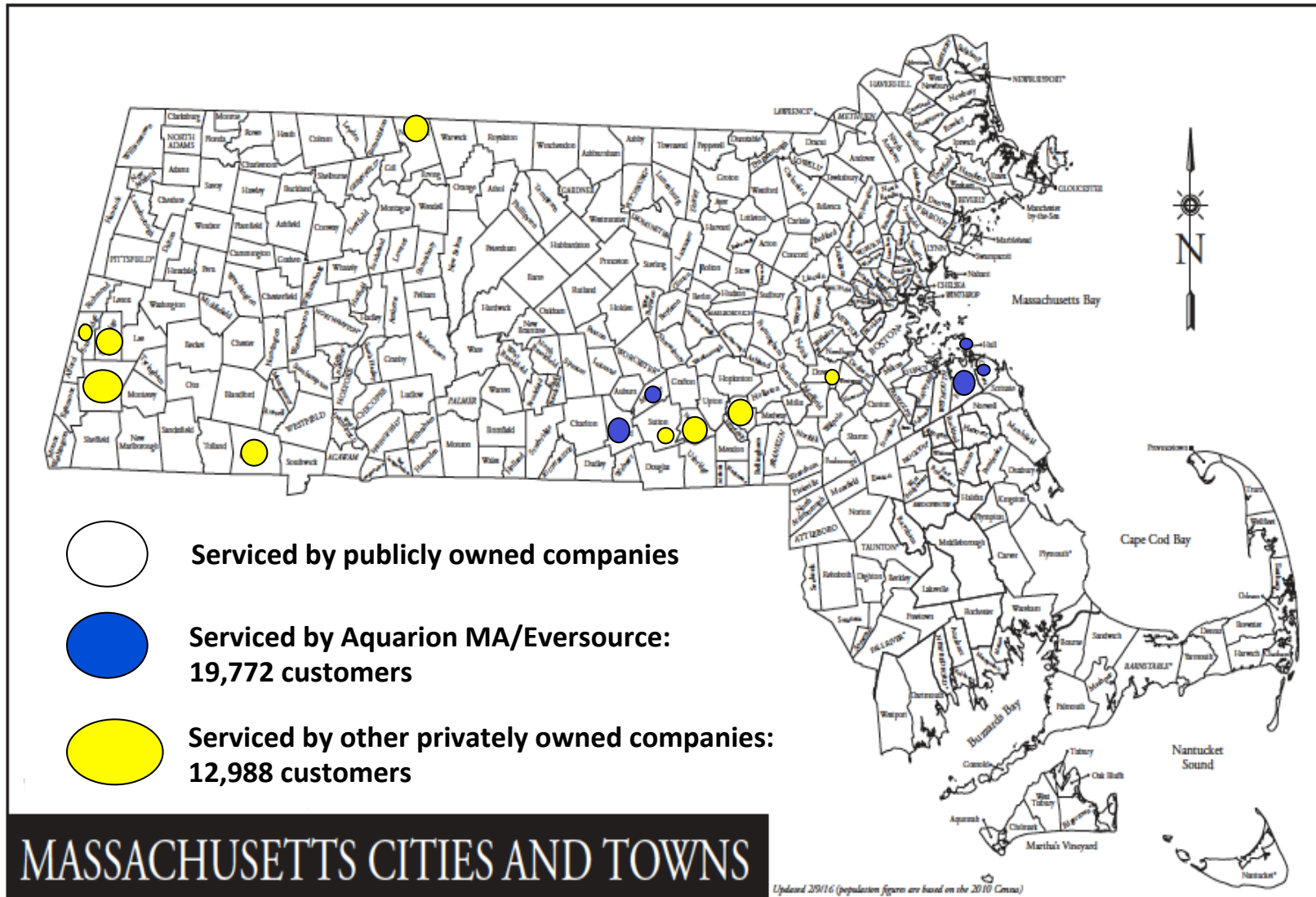
# Engineering Summary

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- **Background**
- **Water System Overview**
- **Operational Issues**
- **Objectives**
- **Approach under Town Ownership**
  - **Daily Operation & Maintenance**
  - **Accelerated Capital Improvement**

# Background: ~1.3% of MA residential water customers are serviced by a privately-owned water company



# Background: MA water regulation



## Massachusetts Department of Environmental Protection

(MASSDEP)

MassDEP is responsible for ensuring clean air and water, safe management and recycling of solid and hazardous wastes, timely cleanup of hazardous waste sites and spills, and the preservation of wetlands and coastal resources.

- **The Massachusetts Dept. of Environmental Protection (DEP) regulates all MA public water suppliers, regardless of ownership**
  - Monitors and regulates water quality and water supply
  - Certifies and licenses treatment and distribution system operators



# Water System Overview

- **Water supply sources**
  - Surface water (Accord Pond)
  - Groundwater (Fulling Mill Wells and other wells)
- **Pumping**
  - 12 wells/pump stations
  - Booster station (Hull)
- **Water Storage**
  - 2 tanks: Turkey Hill, Accord Pond
- **Water Treatment Plant**
- **Distribution**
  - ~ 190 miles of mains
    - Average age = 64.4 years

Sources: March 2011 Tata & Howard Capital Efficiency Plan, Aquarion 2017 Report to DPU



## Issue:

### Lack of coordination with Hingham road-building program



**113** roads were resurfaced or rebuilt between 2012 and 2017.

Water mains were replaced in all or some of **8** of them (**7%** of total).

Year	Number roads resurfaced or rebuilt	Roads in which water mains were replaced	Limits of work
2012	19	Fairview Leonard	Main -Colby St Colby St. - #6
2013	12	East	Hingham Rec Skating Club – Cohasset Line
2014	17	Union	Lazell – Driving Range
2015	12	Free	Lazell – Weir River Culvert
2016	33	0	
2017	20	Turkey Hill Lane Surry Tower	#62 - #86 Croyden – Martin's Lane #47 continuing around circle to #47

## Issue:

### Lack of coordination with Hingham road-building program



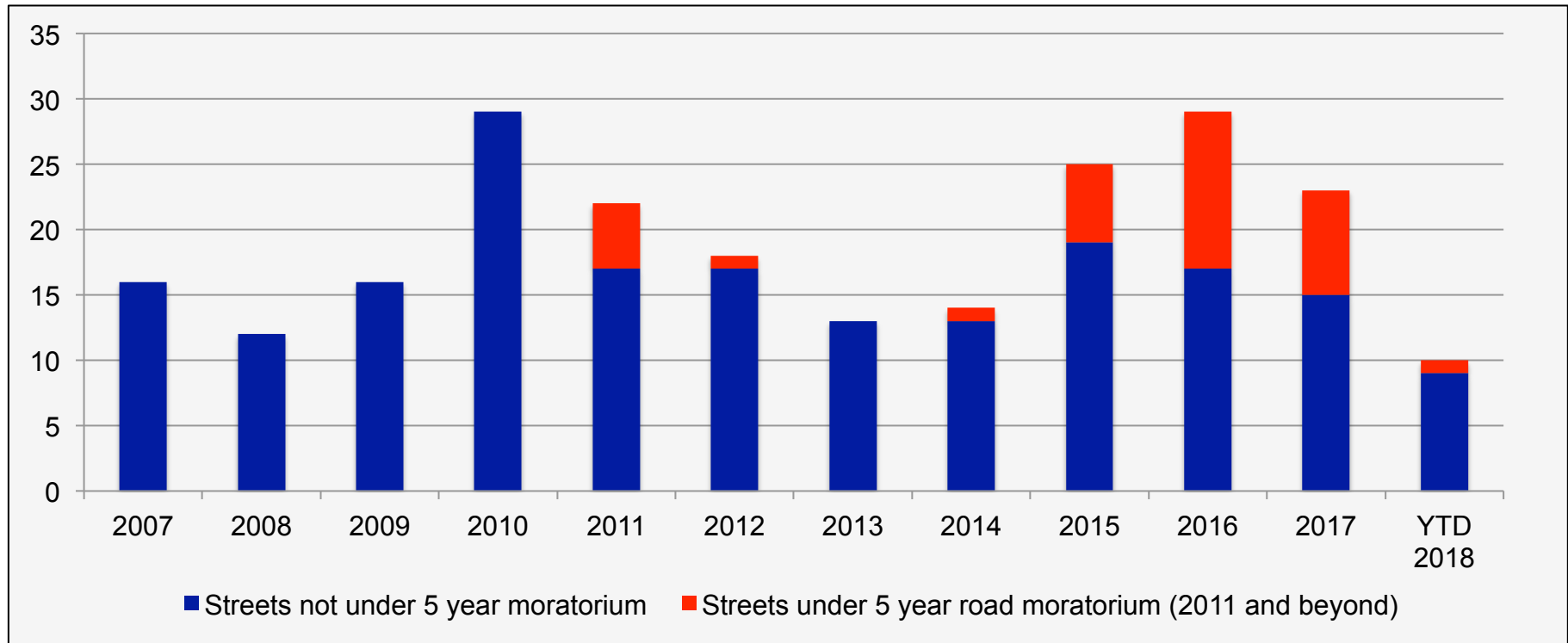
Of the **113** roads resurfaced or rebuilt between 2012 and 2017, **8** contain water mains that were prioritized for replacement by Aquarion commissioned capital studies. The mains were not replaced. Howe Street has already required an emergency street opening

Street	Year Rebuilt/ Resurfaced	Prioritized by Tata & Howard for water main replacement		
		2007	2011	2014
Liberty Pole	2012		x	
Rockwood	2012	x	x	x
Burditt	2014			x
Fearing	2014			x
Grist Mill	2016	x	x	
Howe	2016	x	x	x
Howland	2016	x	x	x
Whitcomb	2016	x	x	x

# Issue: Water main breaks and leaks -> lack of coordination with Town road building program



**Updated:** Hingham Street Opening Permits for  
Emergency Water Repairs: 2007 – May 2018



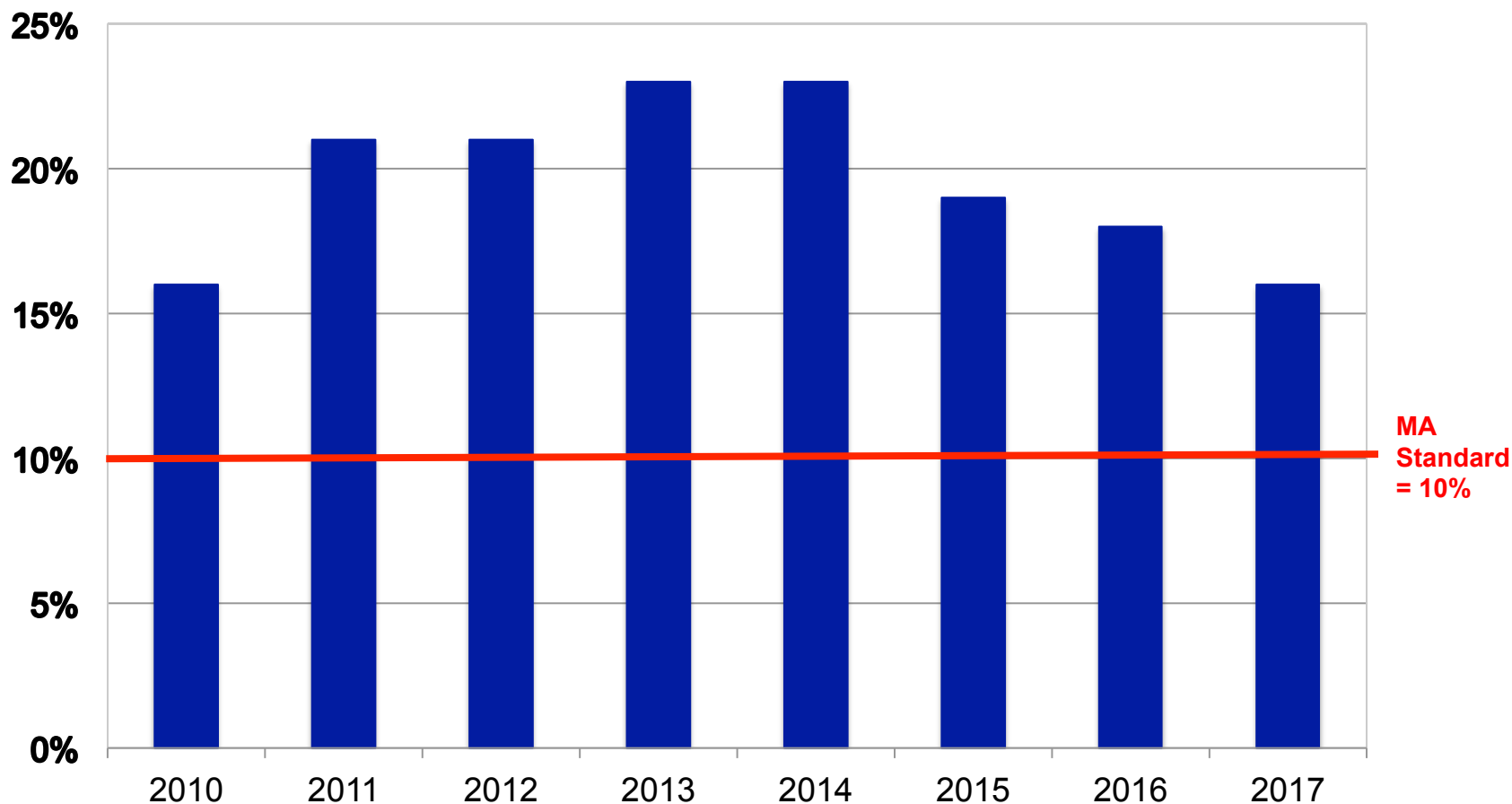
**2011 – 2018 YTD: 22%** of emergency street openings occurred on roads under the 5-year moratorium. Several roads had more than one emergency repair.





# Issue: Unaccounted for Water

**Updated:** Service Area A Unaccounted for Water as Reported by Aquarion  
( - MA Standard = 10%)



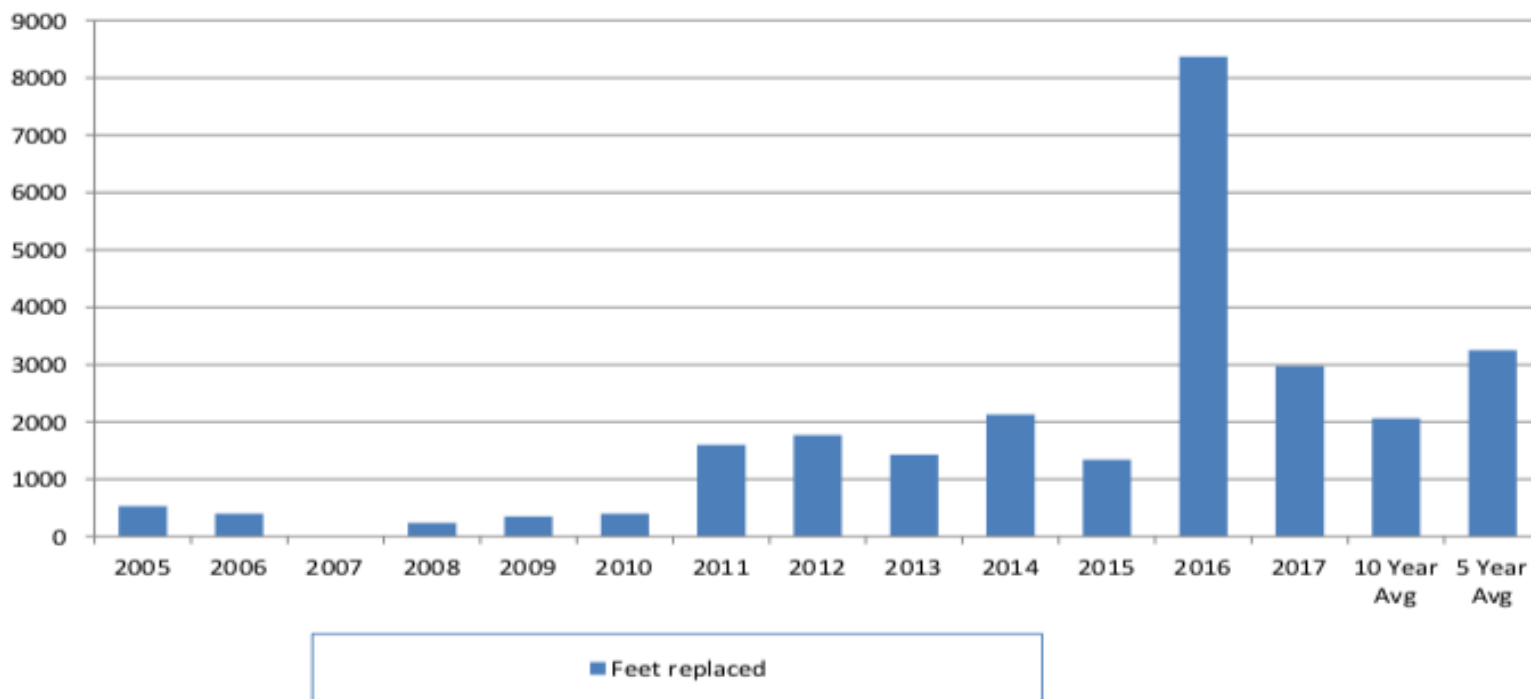


# Issue: Underinvestment in Water Main Replacement

Service Area A: ~ 1 million feet of water mains  
10-year average ~ .2% of mains replaced each year  
5- and 10-year averages heavily influenced by 2016 (rate-case test year)

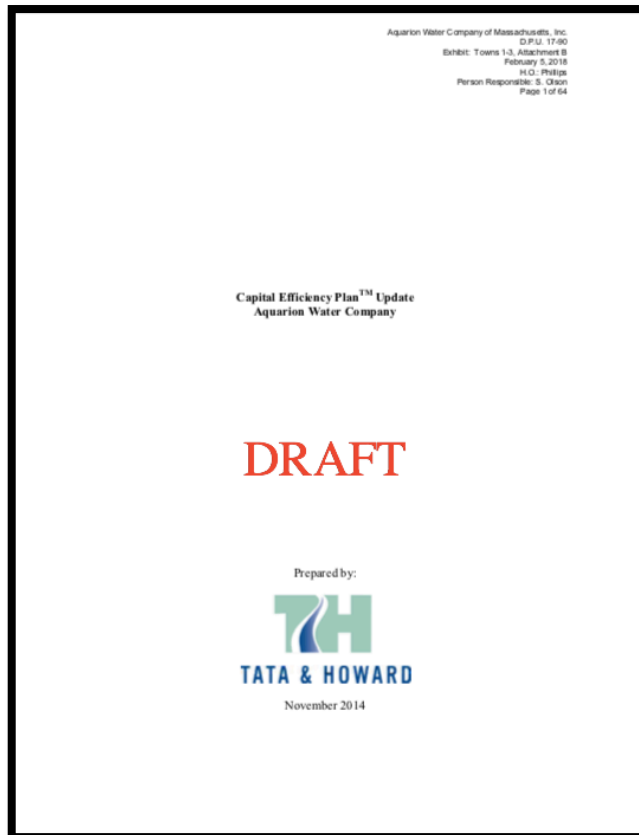
## Service Area A - Historical Water Main Feet Replaced

Sources: DPU File Room; Exhibit RR-HH-6 dated 2 Jul 2018



***“The Company is not in a position to increase the capital budget without introduction of the WRIM mechanism”*** (Source: D.P.U. 17-90 Exhibit: Towns 7-3, 8 Jun 2018)

# Importance of water main investment



***“Regular rehabilitation of  
water mains  
reduces main failures, leakage,  
and water quality issues.”***



# Objectives Under Town Ownership

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- ☐ Ensure daily operations & maintenance result in consistent, high quality service to ratepayers
- ☐ Accelerate capital improvement
  - Develop and implement a long-term, comprehensive asset management plan
- ☐ Identify and, where appropriate, adopt new technology
- ☐ Improve coordination with road-building programs
- ☐ Reduce emergency street openings (especially for roads under 5-year moratorium)
- ☐ Reduce Unaccounted for Water
- ☐ Reduce discolored water complaints

# Town's Initial Approach: Daily Operations & Maintenance

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## **Contract Operations & Maintenance to experienced water system operator**

- Ensures smooth functioning of operations (including customer service)
- Provides access to technical and administrative expertise, including new technologies and best practices

## **Hire Superintendent who meets MA DEP certification and licensing requirements**

- Ensures effective Town oversight
- Enables coordination with Town

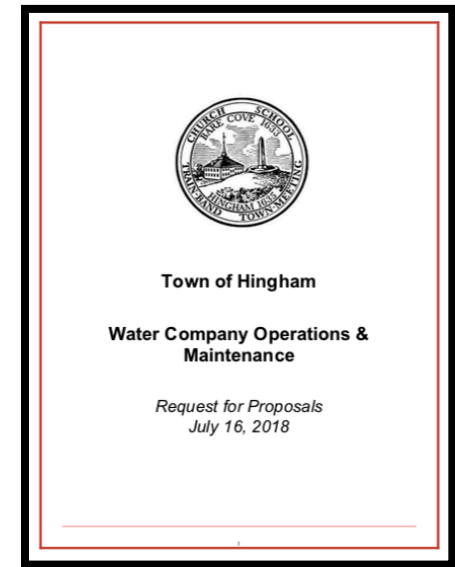
## **Capture and report performance metrics to ratepayers, Town Committees**

- Provides easy public access and visibility
- Ensures transparency and accountability
- Facilitates evaluation of Operations & Maintenance system operator

# Daily Operations & Maintenance: RFP Status



- Developed RFP based on:
  - DEP requirements
  - Input from former water company employees
  - MA procurement laws
- RFP specifies:
  - 13 minimum requirements (see Appendix)
  - 5 comparative criteria
- Issued RFP on July 16
  - Responses due August 13
- While binding, responses are contingent upon Town Meeting approval of purchase



***RFP responses will also allow the Town to validate operations & maintenance costs included in the financial analysis.***

# Daily Operations & Maintenance: RFP Comparative Criteria

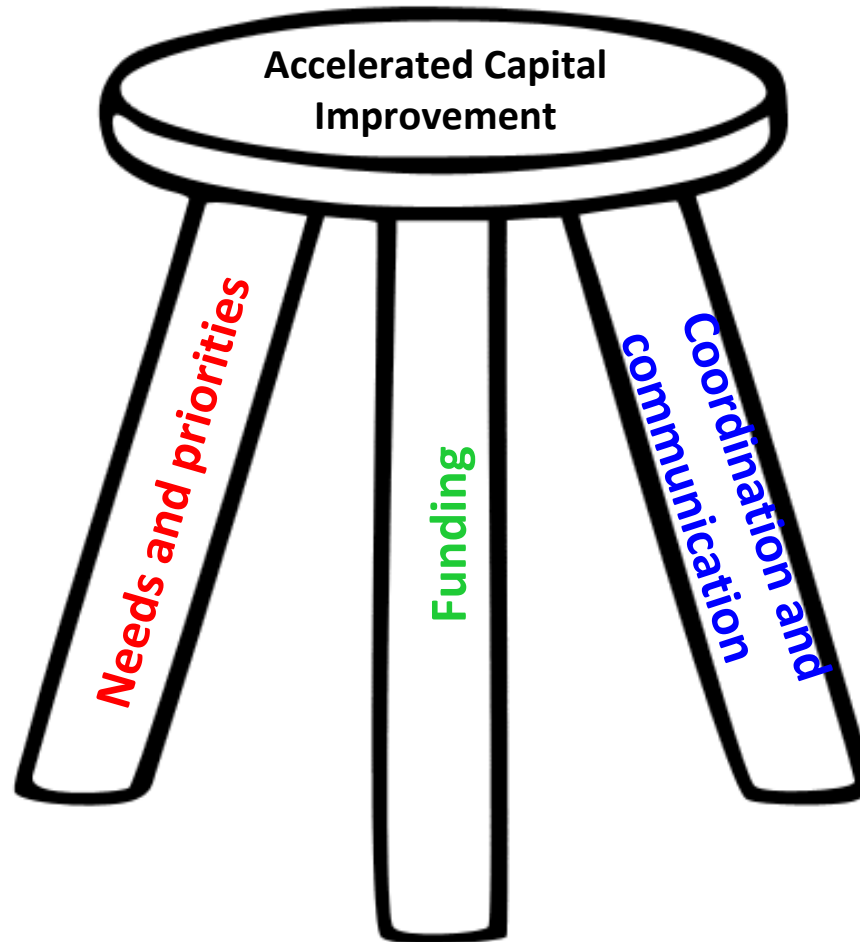
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- 1. Contract experience with the provision of water system operations & maintenance of at least 12,000 customers**
- 2. Experience with transition from a current water system operator to a new water system operator with uninterrupted operations and customer service**
- 3. Experience with a water distribution system with miles of water mains**
- 4. Experience in sludge dewatering process plants**
- 5. Experience in dealing with various sources of water supply**

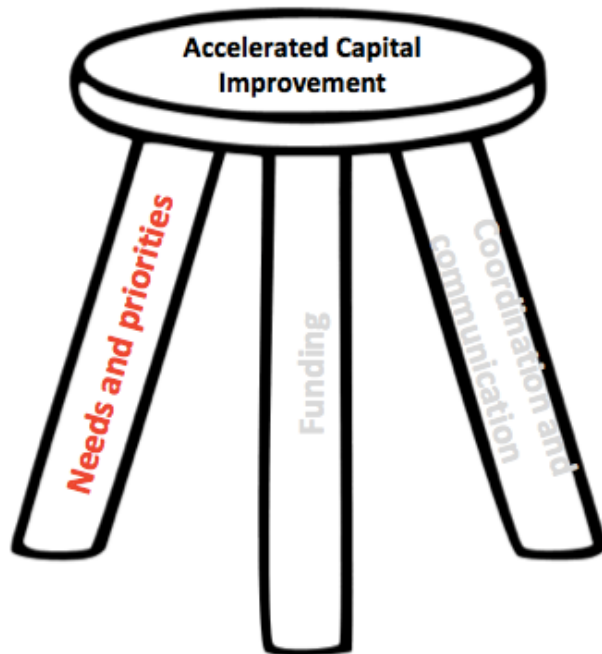
# Towns Approach to Accelerated Capital Improvement

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# Capital Needs and Priorities



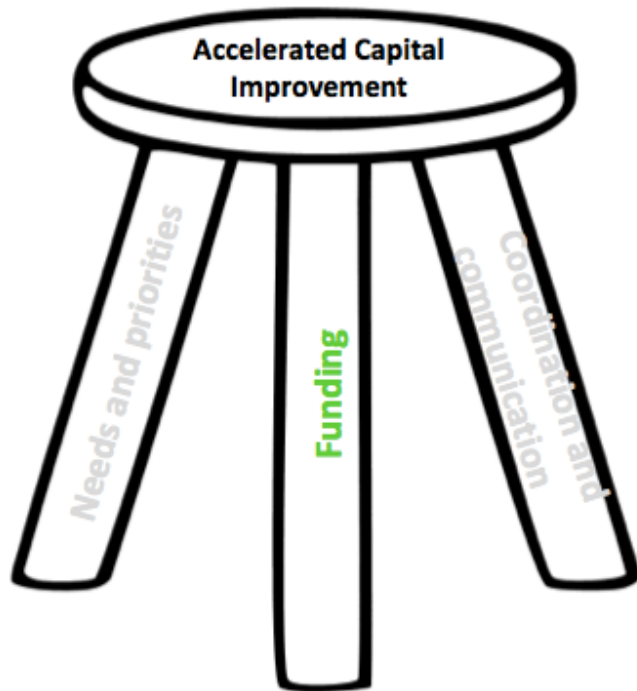
- Utilize DPU Annual Report, infraPLAN KANEW study and Tata & Howard Capital Efficiency Plans (2007, 2011, 2014) to prioritize capital needs (highlights in Appendix)



- Where appropriate, apply methodologies used by Capital Outlay Committee and Town road-building program
- Commission additional capital/engineering studies as needed
- Utilize state procurement process to select capital improvement vendors



# Funding for Capital Investment



- **Ensure Town financial analysis includes sufficient funding for capital**
  - \$3 million funding available upon purchase
  - \$2 million annual investment (starting Year 1)
  - Cumulative Capital Investment:
    - 5 years = \$13 million (avg \$2.6 million/year)
    - 10 years = \$23 million (avg \$2.3 million/year)
    - 30 years = \$63 million (avg \$2.1 million/year)
- **Pursue federal and state grants available to publicly-owned water companies**

# Cost of Capital Improvements: Town vs. Aquarion



There are important differences in the cost of capital improvement projects under Town ownership.

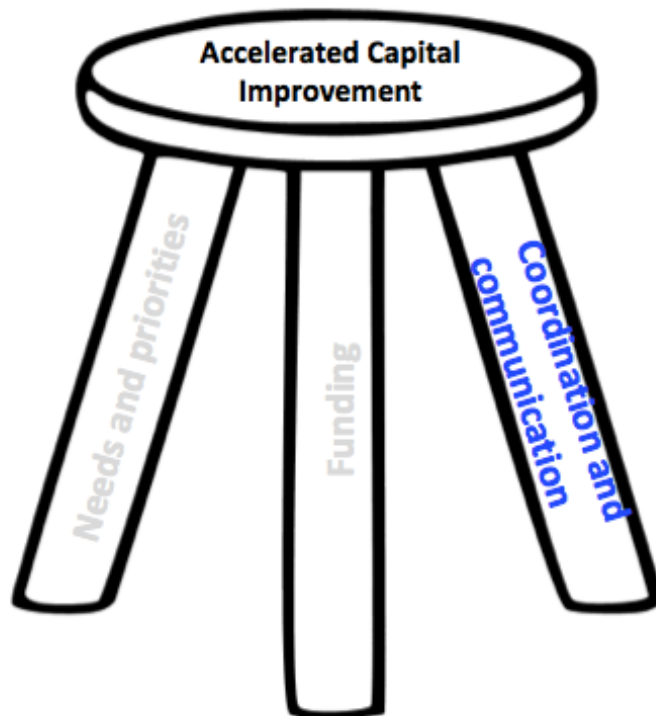
*Differences that will **reduce** the cost of capital improvements*

- Greater coordination of water main replacement with road-building projects:
  - Lower cost to replace mains
  - Fewer emergency repairs (often more expensive)
  - Increases longevity of road, reducing road maintenance costs
- Lower interest rates on capital projects financed with debt
- No guaranteed profit

*Differences that will **increase** the cost of capital improvements*

- MA Prevailing Wage Law

# Coordination and Communication



- Coordinate main replacements with Town road-building work

Table No. 5.2  
Estimated Improvement Cost - Phase I

Item No.	Location	From	To	Water Main Diameter (in)	Length (LF)	Estimated Cost
1	Beach Avenue, Y Street, X Street, W Street, and Lewis Street	Nantuxet Avenue at Y Street	Nantuxet Avenue at Lewis Street	12	6,700	\$ 1,385,000
2	High Street and Friend Street	Stanford Drive	Main Street	12	4,800	\$ 1,350,000
3	Dwight Avenue	Old Street	Broad Cove Road	12	8,300	\$ 2,247,000
4	North Street	Thaxter Street	West Street	12	2,300	\$ 447,000
5	Pepper Street	Harvey Street	Lincoln Street	8	1,450	\$ 316,000
6	Central Avenue	A Street	Q Street	8	3,350	\$ 733,000
7	Calhoun Avenue	Q Street	Nantuxet Avenue	8	1,100	\$ 241,000
8	Main Street	Scotford Street	Whiting Street	12	5,300	\$ 1,450,000
9	Hall Street	Exiting Back on Hall Street	Clark Drive	8	550	\$ 130,000
10	Calhoun Road	Kilby Street	End of Calhoun Road	12	1,400	\$ 394,000
11	Lincoln Street	Thaxter Street	Lampson Road	12	1,450	\$ 409,000
Total Estimated Phase I Cost						\$18,272,000



- Review 5-year capital plan with governing bodies
- Publish annual capital report and make available to ratepayers
  - Similar in scope to annual report of Capital Outlay Committee

# Summary: Town's Approach

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- **Daily Operations & Maintenance**
  - Contract Operations & Maintenance to experienced water system operator
  - Hire full-time water-system manager who meets MA DEP certification and licensing requirements
  - Capture and report performance metrics to ratepayers, Town Committees
- **Accelerated Capital Improvement**
  - Use existing studies to identify and prioritize capital needs; commission additional studies as needed
  - Adequately fund capital needs
  - Coordinate water main replacements with road-building schedules, publish annual capital report



# **Water Company Acquisition**

## ***Engineering Appendix***

August 2018

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# Daily Operations & Maintenance: RFP Minimum Criteria

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- ☐ Contract **experience** with full-service water system operations and maintenance for systems of similar size
- ☐ Understanding and **compliance with MA Dept. of Environmental Protection** monitoring requirements and regulatory conditions
- ☐ Staffing levels
  - ☐ Meet MA certification requirements
  - ☐ Willingness to accommodate Town's preference to **first consider existing water company employees for employment**
  - ☐ **Plant operators licensed** by the Licensing Board of Drinking Water Supply Facilities
- ☐ **Experience in the procurement** of all necessary chemicals, consumables...to operate and monitor Service Area A assets
- ☐ **Experience with the Supervisory Control And Data Acquisition (SCADA) software** currently installed
- ☐ **Experience utilizing a Computerized Maintenance Management System** for keeping records (corrective and preventive maintenance)



# Daily Operations & Maintenance: RFP Minimum Criteria

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- ☐ **Process implementation** and proposed schedules with adequate:
  - ☐ Pumping station and water treatment plant meter calibration
  - ☐ Customer meter reading and meter replacement
  - ☐ Water main flushing
  - ☐ Exercising of gates and valves
  - ☐ Corrosion protection
  - ☐ Leak detection
  - ☐ Hydrant inspection and functioning
  - ☐ Seasonal services
  - ☐ Routine building and ground maintenance
- ☐ Company organization and **financials**
- ☐ Explanation of company's **customer service procedures**
- ☐ 100% Performance Bond
- ☐ At least 3 municipal references
- ☐ Certificate of Non-Collusion
- ☐ Insurance coverage



# DPU Annual Return Highlights



- Financial statements
- Real-estate holdings; land and buildings
- Supply information
- Pumping information
  - Including equipment type and age, amount of water pumped
- Distribution information
  - Size, material, and length of water mains
  - Water towers and stand pipes
  - Service pipe
  - Gates and valves (number, type, size)
  - Hydrants
  - Meters
- Consumption
- Rates

THE COMMONWEALTH OF MASSACHUSETTS

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RETURN  
OF  
AQUARION WATER COMPANY OF MASSACHUSETTS

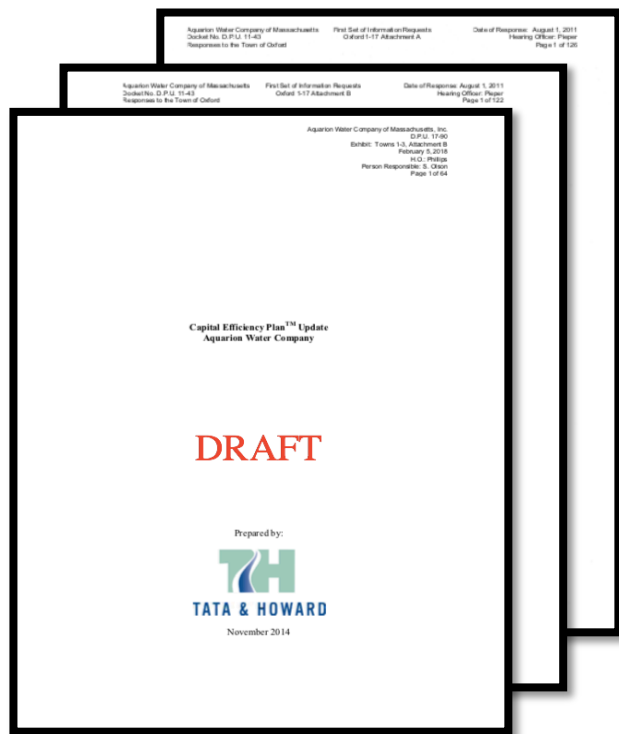
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TO THE  
DEPARTMENT OF PUBLIC UTILITIES  
OF MASSACHUSETTS  
For the Year Ended December 31, 2017

Name of Officer to whom correspondence should be addressed regarding this report.

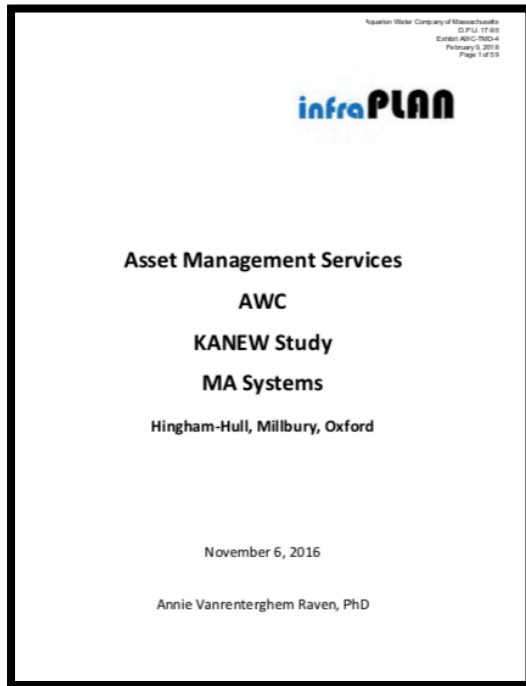
Official Title: Debra Kirven Office Address: 600 Lindley Street  
Controller Bridgeport, CT 06606

# Tata & Howard Capital Efficiency Plans (2007, 2011 and 2014)



- Water Distribution System overview
- Water Supply and Storage Evaluation
- Hydraulic Model Verification and Evaluation (flow)
- Critical Component Assessment
- Asset Management
  - Rating of all water mains
- Recommendations and Conclusions
  - Including prioritization of improvements

# infraPLAN KANEW Study Content



- **Water main data**
  - Number
  - Age
  - Break rate
- **Break rate and investment cost**
- **Future rehabilitation needs per asset type**
- **Capital investment scenarios**
  - **Recommendation: \$1.8 million annual capital investment for water mains for all of MA through 2070**
    - ➔ (@72% = ~ \$1.3 million/year for Service Area A)

# Capital Improvements to water system since previous rate case (2012)\*

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- **Water Treatment Plant improvements**
  - New SCADA system
  - New roof
  - Rehabilitation of centrifuges
  - New chemical system tank and pumps
  - New instrumentation and water quality analyzers
  - New electrical equipment and lighting
  - VFDs for distribution pumps
- **Water system improvements**
  - New transmission main piping
  - Pump station rehabilitation and upgrades
  - New water supply pumps
  - Emergency generator
- **Water main replacements**
  - Hingham: Union, Lazell, Free, East, Fairview, Leonard, Playground
  - Hull: Edgewater, Sunset, Cadish, Atherton, Prospect, Rockland

\* Source: Aquarion "Request for Water Rate Increase" presentation to Town 20 March 2017